

1 **WHAT IS CLAIMED IS:**

2 1. A method for developing a temperature compensated voltage supply
3 comprising the steps of:

4 generating a first base voltage (VTC1) and a second base voltage
5 (VTC2), wherein the first base voltage (VTC1) and the second base voltage
6 (VTC2) have unique temperature coefficients (TC1, TC2);

7 generating an output voltage (Vnew) by summing the first base voltage
8 (VTC1) and the second base voltage (VTC2) assigned with different weights
9 (a,b), such that the new output voltage Vnew has a new temperature coefficient
10 TCnew; and this output voltage (Vnew) satisfies the expression:

11
$$V_{new} = a \times VTC2 + b \times VTC1,$$

12 where the above two weight values (a,b) shall satisfy the conditions: $a+b=1$, and
13 $0 \leq |a|, 1 \geq |b|$.

14 2. The method for developing a temperature compensated voltage
15 supply as claimed in claim 1, wherein the new temperature coefficient (TC new)
16 satisfies the expression :

17
$$TC_{new} = TC1 + a \times (TC2 - TC1).$$

18 3. The method for developing a temperature compensated voltage supply
19 as claimed in claim 1, wherein the first base voltage (VTC1) and the second base
20 voltage (VTC2) are equal when the temperature is T_0 .

21 4. The method for developing a temperature compensated voltage supply
22 as claimed in claim 2, wherein the first base voltage (VTC1) and the second base
23 voltage (VTC2) are equal when the temperature is T_0 .

24 5. The method for developing a temperature compensated voltage supply

1 as claimed in claim 4, wherein the weighted value (a) can be negative.

2 6. The method for developing a temperature compensated voltage supply

3 as claimed in claim 5, wherein the weighted value (a) can be negative.

4 7. A circuit for developing a temperature compensated voltage supply,
5 comprising:

6 a base voltage generator for generating two base voltages (VTC1, VTC2)

7 having different temperature coefficients (T1,T2), whereby the base voltages

8 (VTC1, VTC2) are equal when the temperature is equal to the reference

9 temperature, a zero value;

10 an output voltage generator for generating output voltage (Vnew) based

11 on different weighted values (a, b) assigned to the two base voltages (VTC1,

12 VTC2), wherein

13 the output voltage generator is connected to an output of the base voltage

14 generator, and the two weighted values (a, b) satisfy the conditions: $a+b=1$, and

15 $0 \leq |a|$, $1 \geq |b|$; and

16 the temperature coefficient (TCnew) of the actual output voltage (Vnew)

17 is determined by the temperature coefficients (T1,T2) on the two base voltages

18 (VTC1, VTC2), satisfying the expression

19 $TC_{new} = TC1 + a \times (TC2 - TC1)$.

20 8. The circuit for developing a temperature compensated voltage supply

21 as claimed in claim 7, wherein the base voltage generator in the temperature

22 compensated voltage supply circuit further includes:

23 a current mirror (10) having an output side connected by a resistor (R)

24 and a diode (D) connected in series, and an input side has a diode (D₀), wherein a

1 diode contact area of the diode (D) on the output side is N times greater than that
2 of the diode (D_o) on the input side;

3 a first output circuit (20) having an input connected in parallel to an
4 output of the current mirror (10), and in series to a resistor (R1) and a diode (D1),
5 wherein one end of the resistor (R1) becomes an output node for the first base
6 voltage (VTC0); and

7 a second output circuit (30) having the input connected in parallel to the
8 output of the current mirror (10), and connected in series to a resistor (R2),
9 wherein one end of the resistor (R2) becomes an output node for the second
10 output voltage (VTC).

11 9. The circuit for developing a temperature compensated voltage supply
12 as claimed in claim 8, wherein the output voltage generator is formed by two
13 resistors connected in series, and two ends are respectively connected to the two
14 base voltages (VTC1, VTC2), and the junction where these two resistors are
15 connected forms an output node for an output voltage (Vnew).

16 10. The circuit for developing a temperature compensated voltage supply
17 as claimed in claim 9, wherein the weighted value (a) depends on the ratio
18 between the two resistors.

19 11. The circuit for developing a temperature compensated voltage supply
20 as claimed in claim 8, wherein the output voltage generator further includes four
21 switches (S1, S3, S21, and S22) and three capacitors (C1-C3), wherein
22 two ends of the first capacitor (C1) through the switches (S1, S21) are
23 connected to an output node for the first base voltage (VTC1), and one end of the
24 first capacitor (C1) through the switch (S22) is connected to an output node for a

1 second base voltage (VTC2);

2 the second and third capacitors (C2, C3) are connected in parallel to the
3 first capacitor (C1), with a switch (S3) mounted between the second and third
4 capacitors (C2, C3) for switching capacitors, where one end of the third capacitor
5 (C3) becomes an output node for the output voltage (Vnew); and

6 the four switches (S1, S3, S21, and S22) are controlled by three non-
7 overlapping clock signals (P1)~(P3).

8 12. The circuit for developing a temperature compensated voltage supply
9 as claimed in claim 11, wherein the clock signals for the four switches (S1, S3,
10 S21, and S22) satisfy the following conditions:

11 S1=P1

12 S3=P3

13 S21=P1

14 S22=P2.

15 13. The circuit for developing a temperature compensated voltage supply
16 as claimed in claim 111, wherein the clock signals for the four switches (S1, S3,
17 S21, and S22) satisfy the following conditions:

18 S1=P1

19 S3=P3

20 S21=P2

21 S22=P1.